

Radiation

Safety

Committee

Minutes of Radiation Safety Committee of August 25, 2005

Subject: Controlled Access for NSRL Target Room without Operator Intervention

Present: D. Beavis, E.T. Lessard, C. Pearson, D. Phillips, P. Ingrassia, C. Schaefer, A. Rusek, J. Reich, P. Cirnigliano, P. Pile, J. Maraviglia, B. Oerter, J.W. Glenn, R. Karol, A. Etkin, and P. Bergh

The committee reviewed the proposal (see attachment 1) for a system to monitor controlled accesses at the NSRL target room gate without operator intervention. The committee did not make a specific recommendation on the implementation of such a system since some details needed to be clarified.

Motivation

P. Ingrassia (see attachment 2) provided some background numbers for controlled accesses at NSRL. Controlled accesses at NSRL can be very frequent (up to 25 per hour) and can total up to 4000 accesses per year. The MCR operators presently supervise the controlled accesses via video cameras and simultaneous release. The operation has been judged to be very efficient with no unsafe failures. NSRL has had a total of approximately 10,000 controlled accesses during the previous runs. The frequent accesses has created strain on the operators and resulted in substantial job dissatisfaction. The proposed system without operators is an effort to address the strain caused on the operators by the frequent accesses.

Discussion

A. Rusek presented an overview (see attachment 3) of NSRL accesses and J. Reich presented details (see attachment 4) of a proposed system for monitoring the controlled accesses without operator intervention.

The design of a system to monitor and count personnel during controlled accesses requires a specification for the numbers of failures unsafe and failures safe. A failure safe causes a loss in efficiency but not safety. These “false alarms” need to be kept at a minimum and presently are about 30 per year with operator control. An unsafe failure means that the system has allowed someone to be left inside the enclosure and has allowed the time sequence to start for introducing radiation (min. 30 seconds). A value of

1/10000 for unsafe failures was used in the presentations and was provided as an order of magnitude by the RSC chairmen at a meeting with a vendor. This level is achievable by the vendors. The committee requested that a subgroup be assigned to provide a number for the rate at which unsafe failures could occur. **(CK-NSRL-FY2006-459)**. It was suggested that 1/10000 is too large. This would imply an unsafe failure every 2-3 years. On an unsafe failure the user inside the area would need to activate the crash system within the allotted time to avoid exposure.

The system presented was composed of three components. The first component is a video camera system that provided tracking and counting of personnel. The second component was an RF tag system that had detection stations on each side of the entrance gate. Finally, a motion detection system would check for motion in the enclosed area. The motion detection proposed was part of the video system.

The failure rates need to be clarified for the committee. The committee would like to have more details on what challenges cause the system to have an unsafe failure. **(CK-NSRL-FY2006-460)** It was stated that the failure rate of component 1 and 2 combined could be 1/10000 or lower but it was not known how this depends on the number of people accessing or how close in proximity multiple people could be without causing a failure. With more details it might be possible to add administrative features through user training, which could effectively reduce the failure rate to zero.

The sensitivity of the video system on lost pixel (resulting from potential radiation damage) should be considered in the final design. **(CK-NSRL-FY2006_461)**

The proposal presented had more detail than discussed in these minutes. The committee will reconsider the proposal after the additional details on failure rates are provided. Several committee members had seen the demonstrations provided by vendors and were impressed by the technology. An alternate approach was suggested of using temporary personnel as dedicated gate watches for the NSRL accesses to relieve strain on operators.

Attachments (file copy only)

- 1) Description distributed by e-mail, A. Rusek.
- 2) Presentation by P. Ingrassia.
- 3) Presentation by A. Rusek.
- 4) Presentation by J. Reich

CC:

Present
RSC
RSC Minutes file
RSC NSRL file